The Principles and Abilities of Pedestrians

Arizona State Statutes define pedestrians "as any person afoot. A person who uses an electric personal assistive mobility device or a manual or motorized wheelchair is considered a pedestrian unless the manual wheelchair qualifies as a bicycle. For the purposes of this paragraph, motorized wheelchair means a self-propelled wheelchair that is used by a person for mobility." (A.R.S. 28-101.40)

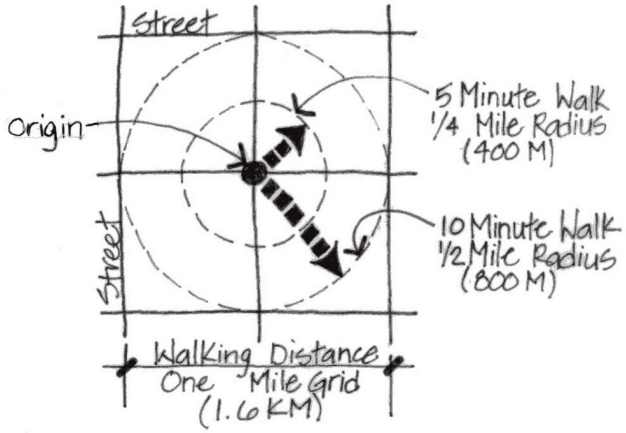
Throughout this document, the term 'walk' or 'pedestrian' refers to people who are walking or using some form of special walking aid or motorized or non-motorized assistive technology device.

Certain principles or assumptions have emerged as common factors found in all types of successful pedestrian areas and they explain the conditions needed for people to choose to walk. **All are of equal importance and relevance.**

PRINCIPLE #1

People will choose to walk a 10-minute trip or a ¼ mile to a destination and even longer (up to 20 minutes or a ½ mile) if the route is comfortable and safe or if the need is great.

The most common reason cited nationally as to why people do not choose to walk is real or perceived distance. Other factors which contribute to an individual's decision to walk are how safe they feel when using the facility (this applies to feeling safe from the threat of being hit by a car and assault by another person), weather, and comfort. Research by the Federal Highway Administration (FHWA) shows that most people will walk ¼ mile (0.4km), or approximately 1,400 feet (427m) with one mile (1.6km) as the maximum distance



The 10-minute rule.

of a walking trip. Research also shows people of average ability walk at an average of 4 feet (1.2m) per second. When translated into minutes, the ¼ mile trip takes five minutes and the ½ mile trip takes ten minutes. Younger, older, and persons with disabilities tend to walk more slowly (2.5 to 3 feet per second). This means that they may take slightly more time (approximately seven minutes) to walk ¼ mile, and as much as 15 minutes to walk ½ mile.

A pedestrian area is more likely to be successful if walking routes from residences or other origins to destinations recognize distance and directness of the route as planning criteria. Regular spaced seating areas or resting spots will increase the distance traveled by all pedestrians. This is especially important in areas where a large portion of the population has limited access to motorized transportation. A successful pedestrian area combines a strong linkage between residences and places of basic necessity with convenient pedestrian access to a public transit system that connects with the rest of the community.

PRINCIPLE #2

People will choose to walk if the route is interesting.

Pedestrians will walk farther than ½ mile (0.8 km), or longer than ten minutes, if the route is interesting. The route can be made interesting by other pedestrians, or by providing elements such as public art, plantings, storefronts with windows and doors, long views and vistas, and interpretive signs.

Pedestrians enjoy the shops.

PRINCIPLE #3

The land use mix and its density influences whether people walk.

People are more likely to walk to their workplace, entertainment venues, or destinations that provide basic necessities, if they are within ½ mile. For example, mixed-use or new urbanist style development (development that mixes different land uses such as housing, services, shopping, entertainment, and employment) has been shown to reduce both automobile use and overall parking needs.

Within the MAG region, some new development has included mixed use components that have been well-received. These developments are generally located in downtown areas or are the focus of large, master planned communities. However, most new development still consists of single use, low-rise, low-density development, with segregated retail and employment uses. Continued support of denser development and varied land uses in residential and employment areas, accessed by direct pedestrian routes, could encourage more pedestrian travel, reduce overall parking needs, and decrease traffic congestion.

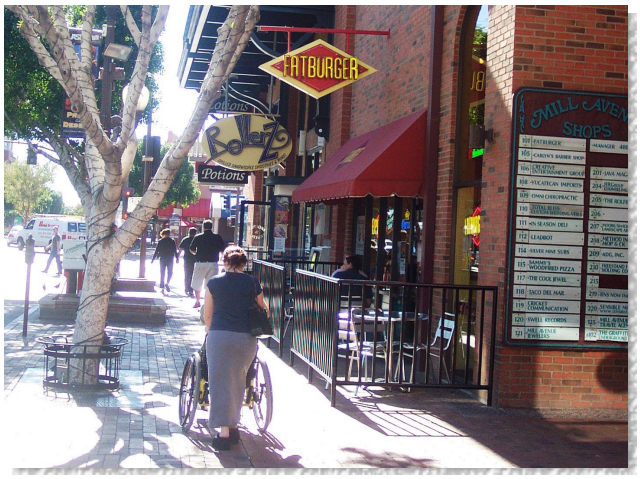
PRINCIPLE #4

In a dense, urban setting, the pedestrian route is more likely to be used if destinations are closely spaced and building entrances are located immediately adjacent to the pedestrian route.

Easy pedestrian access to retail shops, and the close spacing of these shops, is to the advantage of the pedestrian and the retailer. This is evidenced by the renewals of downtowns and dual-entrance retail, common to many new urbanized developments. For example, access only from parking garages or lots increases the distance of the pedestrian trip, which can discourage walking.

Closely spaced locations eliminate the need for linked trips with a series of stops and starts. A variety of destinations in one location also increases the number of pedestrians. Studies have found that 15 percent of vehicular lunch time trips are to destinations less than ½ mile away. Clustering these destinations within walking distance of the workplace enables these trips to be made by a pedestrian rather than a vehicle. Research shows that store fronts with entrances ranging from 35 feet (10m) to 60 feet (18.3m) apart are best, depending on the intensity of the area. The shorter the distance between destinations, the more accessible the destinations and the more interesting the walking/shopping experience will tend to be.

Conversely, long walls without entrances or windows will cause a pedestrian to stop walking, assuming there is no more to see.



People enjoy closely spaced shops.

PRINCIPLE #5

Pedestrians seek the most direct route. The lack of a safe, convenient, direct route may determine whether people walk or not.

Many residential communities are surrounded by walls, or are gated for security. These features create barriers to transit stops and neighboring commercial areas with convenient shopping and services. If safe, convenient pedestrian connections are provided to these destinations from residential neighborhoods, people could choose to easily walk to these destinations. Additionally, if signs, landscaping, decorative paving, or other distinctive features are used to clearly mark the route and make it more pleasant and interesting, the route will more likely be chosen as an alternative to using a vehicle.

People choose the most direct route.

PRINCIPLE #6

Safety is paramount.

The Arizona Department of Transportation (ADOT) *Motor Vehicle Crash Facts 2000* reports that 1.26 percent of all crashes in the year 2000 involved pedestrians. Of that number, 7.86 percent, or 130 crashes, were fatal. Put more simply, two to three Arizona pedestrians die each week because they were hit by a car. Over 27 Arizona pedestrians are injured every day due to crashes with vehicles.[6]

Implementation of a safety program can help to diminish pedestrian/vehicle conflicts. One such program is WALK ALERT (Operation PedSaver). WALK ALERT is a comprehensive program addressing pedestrian safety from three points of view: public education, traffic engineering, and law enforcement. It is also known as the National Pedestrian Safety Program, and is a cooperative effort of the National Safety Council, Federal Highway Administration (FHWA), National Highway Traffic Safety Administration (NHTSA), and more than 100 service organizations and groups. The goal of the WALK ALERT program is to reduce pedestrian accidents through the development of safer walkers, more attentive drivers, and a safer walking environment. WALK ALERT has already been implemented in approximately ten states and continued federal support is expected, which will hopefully result in its continued adoption in other states.

Many States have also implemented programs for older adults and child pedestrian safety. Frequently these programs are offered by police departments and schools. For example, El Paso, Texas has implemented a safe communities program that includes enforcement, data collection and education to increase the safety of its streets.[7] Florida also offers many programs on pedestrian safety and works with local governments to implement these efforts.[8] The California Safety Council offers fairs and festivals that promote pedestrian safety.[9] The FHWA also provides guidance materials on implementing pedestrian safety programs.[10]

Another approach, in addition to educating pedestrians about reducing danger due to moving vehicles, is to decrease traffic speeds and notify drivers that pedestrians may be nearby. Traffic calming is commonly used to decrease traffic speeds and includes a variety of design components including chokers, median strips, speed bumps and humps, and narrow lanes to slow drivers down. Signing, in-pavement markers, dagmars, striping, and changing textures are all tools for making drivers more aware of their surroundings and alerting them to the potential of a pedestrian using the roadway. Traffic calming is discussed more in the Specific Design Guidelines.

PRINCIPLE #7

People will create their own path.

If people have to walk, or have a strong desire to do so, they will walk even if there is no clear pedestrian route provided. Trespassing and vehicular/pedestrian conflicts can result if pedestrian needs are not met in a reasonable way. Paths worn across open areas indicate a "desire line" where people have a need to walk to a particular destination. Jaywalkers on a busy street indicate that people will take the most direct route, even if it is not the safest route. Jaywalkers and desire lines are an indicator that people will not walk out of their way to use provided routes if those routes are not the shortest to their destination.

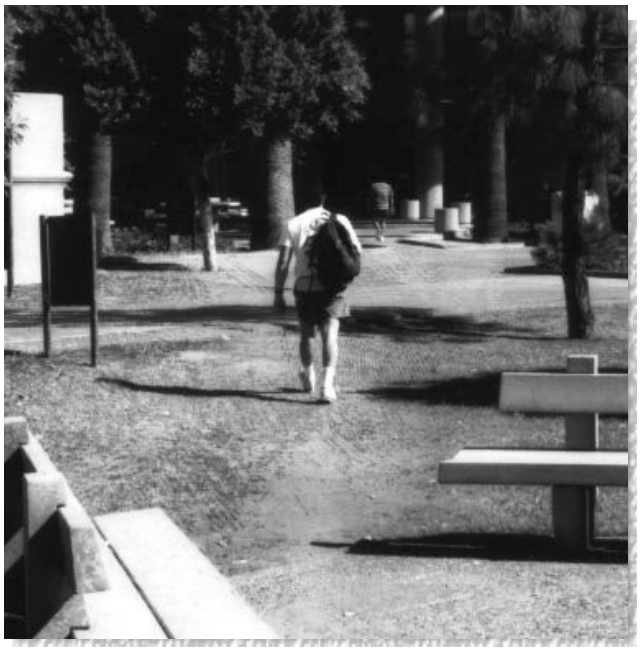
[6] *(http://www.azdot.gov/mvd/statistics/crash/index.htm).*

[7] *(http://www.elpasotexas.gov/police/safe_communities.asp)*

[8] *(http://www.dcp.ufl.edu/centers/trafficsafetyed/trainingworkshop.htm)*

[9] *(http://www.safetycouncilonline.com/healthfairs.htm)*

[10] *(http://www.fhwa.dot.gov/environment/bikeped/pedbiketrb2004.htm)*



People wear a path to where they want to go.

PRINCIPLE #8

The number of driveway crossings along a walkway is inversely proportional to the pedestrian's perception of it as a desirable route.

Driveway crossings along a street to accommodate vehicular access means the pedestrian has to stop for a car turning in, has to move around a car waiting to enter traffic, or, at least, must be on the alert for these situations. The more frequently this occurs, the less the walkway is perceived to be a continuous pedestrian route. Therefore, minimizing driveway crossings and consolidating driveways will help keep the pedestrian route intact.

PRINCIPLE #9

If people do not feel personally secure, even though the pedestrian route is considered safe from traffic, they will not choose to walk.

Multiple driveway crossings are difficult to manuever.

As part of the research for the 1995 document, individuals were asked what levels of surveillance by police made them feel secure. The research indicated pedestrians perceive car patrols are only somewhat safe. The most positive method of providing a feeling of security for the pedestrian is furnishing foot or bicycle police patrols. These security measures represent parity with the pedestrian; whereas a patrol car separates the police from the individual. People also seek out other pedestrians, and perceive strength in numbers. Heavily used pedestrian areas that have no visibility barriers tend to police themselves.

Community design also influences a pedestrian's sense of personal security. Crime Prevention through Environmental Design, or CPTED, is a recognized set of design principles that can result in an environment being safer and more secure for a pedestrian.[11] Some key CPTED principles include natural surveillance, territorial reinforcement, natural access control and target hardening[12].

[11] *(http://www.cptedtraining.net/)*
[12] *(http://cpted-watch.com/introduction.htm)*

Regular maintenance and upkeep also make an area feel more secure. People feel safer in a clean, organized environment.

Lighting can enhance people's feeling of security. In most cases, lighting designed for the automobile is assumed to project sufficient lighting for pedestrian facilities adjacent to the roadway. However, the overhead light provided by vehicular lighting is often shadowed by buildings and trees, and may not be sufficiently bright on the pedestrian's walking surface.

Lighting in more intensively used pedestrian areas should be sufficient to illuminate the wider walkway area. Incidental light can also be provided from store window displays, which in turn can also enhance the walking experience.

PRINCIPLE #10

Pedestrians like to be separated from moving traffic.

The general lack of on-street parking in retail and commercial areas is one of the most distinct differences between our region and other regions of the country. Over time, the need for accommodating vehicular traffic and improving air quality has led to the removal of parallel or diagonal parking, reduced overall walkway areas, landscaping removal and thus reduced shade adjacent to the remaining walkway.

In new commercial areas, parking has been moved off the street and into parking lots. This has increased the distance the pedestrian must walk from the street to their destination. Curb cuts provided for vehicular access to the parking areas from the street has created more curb ramps and driveway crossings, diminishing the effectiveness of the walkway. Finally, even pedestrians in a parking lot must walk from their cars in an area

People like to be separated from traffic..

that is not protected from other cars, and is commonly unshaded.

On-street parked cars offer a sense of safety and buffer pedestrians from vehicular traffic. People parking, getting into and out of their cars, and darting into shops also add to the pedestrian life of the area. A buffer between a roadside pedestrian facility and moving traffic can also be achieved by placing a landscaped area between the facility and the roadway. Where space is limited, a vertical barrier such as a curb, low wall, fence, or bollard can also separate pedestrians from traffic.

PRINCIPLE #11

People will choose to walk if the walkway has sufficient capacity.

Walkway capacity is dependent on the anticipated level of use, the intensity and speed of traffic to which it is adjacent, and the number of obstacles within the walkway.

The capacity of walkways is directly related to the effective walkway width, or that portion of the walkway available to, or typically used by, pedestrians for movement. Walkway width should

Wide walkways encourage walking.

change with the anticipated level of pedestrian use, to accommodate more and different types of users, and the social interaction generated.

Studies have found there is also a "buffer effect" that will limit the effective walkway width - that people will shy away from the curb, building walls, window shoppers, and street furniture such as benches, trash containers, and planters. Light poles, for example, can preempt as much as 3.5 feet (1.0m) of the total width of the walkway. If street traffic is usually fast, heavy, and adjacent to the curb, the width of the sidewalk must be adjusted to account for the buffer effect. Stationary objects such as a parked cars, fences and bollards, or a horizontal distance such as a bike lane that separates the pedestrian from the moving vehicles provides a buffer effect.

PRINCIPLE #12

Pedestrians feel most comfortable in areas that have human scale in design elements.

The edges, detailing, and texture of the pedestrian spaces defines its scale for the pedestrian. People are more comfortable in areas that are scaled for the pace they travel and the space they need to maneuver. Ratio of building height to street, walkway width, frequency and height of windows, doorways, or openings, hardscape and plant materials, and street furnishing can add to or detract from a sense of human scale in the pedestrian area.

In addition to scale, the organization of the of space within the pedestrian environment can contribute to the comfort of the pedestrian. Organizing pedestrian environments so pedestrians can recognize areas where they may come into close contact with vehicles or other users such as equestrians, bicycles or roller-bladers (or even have to share their space with them); where they can expect amenities such as benches or shade; and where they can expect that only pedestrians will be allowed, helps the pedestrian to manage their space and make it human-scale.

A Home Depot in Manhattan recognizes the importance of a human scale to attracting pedestrians. It has replaced its typical tall blank walls with display windows. The windows create a human scale because they have elements that are human sized and to which pedestrians can relate.[13] More and more, big box retail stores

Human scale places are more inviting.

[13] *(USA Today, Big-box stores squeeze into Big Apple. October 18, 2004.)*

are modifying their designs so that they are more appropriate to their environment. These modifications include providing pedestrian facilities to guide shoppers from the street through parking lots, re-situating buildings closer to the curb to make them more accessible to pedestrians (and more visible to passing automobiles), improving lighting, and re-orienting delivery areas to enhance "back door" access from adjacent neighborhoods.

Home Depot Manhattan.